

### **An Attachment for a Cleaning Appliance**

The invention relates to an attachment for a cleaning appliance particularly, but not exclusively, for a vacuum cleaner. The invention also provides a combination of an attachment holder and at least one attachment. The invention further provides a vacuum cleaner having at least one attachment.

Attachments for vacuum cleaners are well known and are commonly provided by vacuum cleaner manufacturers to allow their products to be used for a wide variety of uses. For example, many vacuum cleaners are provided with stair tools for cleaning staircases, brush tools for dusting surfaces without scratching, and crevice tools for cleaning in small areas which are inaccessible using larger tools. These tools or attachments are normally connected to either a hose end or a wand of the vacuum cleaner with which they are to be used by means of a simple friction fit between the cylindrical hose end or wand and the cylindrical neck of the tool. Occasionally, catches or bayonet fittings are provided to increase the reliability of the connection. However, the friction fit between the cylindrical neck of the tool and the cylindrical part to which it is to be connected is intended to provide a seal in the area of the connection. It is also known to provide attachments which have permanent bleed holes provided therein in order to prevent the attachment from developing too much suction at its mouth and thus becoming stuck to particular surfaces. These can be expensive to manufacture and the bleed holes can also become blocked.

If tools or attachments are provided with a vacuum cleaner, the manufacturer faces the issue of storage of those tools. Consumers appear to prefer to have tools stored on board the vacuum cleaner but they also prefer smaller, lighter vacuum cleaners. Storage of tools on board vacuum cleaners and other cleaning appliances thus presents the manufacturer with some challenges.

It is an object of the present invention to provide an attachment for a cleaning appliance which is economical to manufacture and which is unlikely to become stuck to any

surface on which the tool or attachment is used. It is a further object of the invention to provide an attachment for a cleaning appliance which is efficient to store on a vacuum cleaner.

- 5 The invention provides an attachment for a cleaning appliance having a head and a neck, the neck being adapted to be connected to the mouth of a wand or hose of the cleaning appliance and the neck having a first portion which, in use, lies alongside the mouth of the wand or hose, characterised in that the neck has a second portion which, in use, is spaced away from the mouth of the wand or hose so that an air passageway is  
10 formed between the second portion of the neck and the mouth of the wand or hose.

- The provision of the second portion of the neck which, in use, is spaced away from the mouth of the wand or hose allows air to be bled into the wand or hose without passing through the attachment. This permanently reduces the suction developed at the mouth  
15 of the attachment and reduces the risk of the attachment sticking to a surface on which the attachment is used. The arrangement is simple and easy to manufacture and thus the costs involved in manufacture are reduced in comparison to other tools.

- In a preferred embodiment, the second portion of the neck projects inwardly from the neck, which is preferably cylindrical. This reduces the minimum diameter of the neck  
20 which provides an advantage with regard to storage of the attachment, particularly when the attachment is stored on the hose or wand, since the attachment can be stored closer to the hose or wand than prior art attachments.

- 25 The invention also provides a combination of an attachment holder for a cleaning appliance, the cleaning appliance having a wand or hose, and at least one attachment according to the invention. The invention further provides a vacuum cleaner having a wand or hose and at least one attachment according to the invention.

- 30 Embodiments of the invention will now be described with reference to the accompanying drawings in which:

Figure 1a is a perspective view of a first embodiment of an attachment for a cleaning appliance according to the invention;

5 Figure 1b is an alternative perspective view of the attachment of Figure 1a;

Figure 2 is a sectional view illustrating the connection between the attachment of Figures 1a and 1b and a hose or wand of a cleaning appliance;

10 Figures 3a and 3b are different perspective views of a first alternative attachment similar to that shown in Figures 1a and 1b;

Figures 4a and 4b are different perspective views of a second alternative attachment similar to that shown in Figures 1a and 1b;

15

Figure 5a is a perspective view of an attachment holder and three attachments according to the invention located on the wand of a cleaning appliance;

20 Figure 5b is a sectional view of the attachment holder, attachments and wand of Figure 5a;

Figure 6 is a side view showing the location of an attachment holder according to the invention on the hose of a vacuum cleaner;

25 Figure 7a is a sectional view of the neck of a second embodiment of an attachment according to the invention attached to the hose or wand of a cleaning appliance;

Figure 7b is a sectional view of the neck of a third embodiment of an attachment according to the invention attached to the hose or wand of a cleaning appliance; and

30

Figure 7c is a sectional view of the neck of a fourth embodiment of an attachment according to the invention attached to the hose or wand of a cleaning appliance.

5 A first embodiment of an attachment according to the invention is shown in Figures 1a and 1b. The attachment takes the form of a crevice tool 10 which has a head 20 and a neck 30. The head 20 has an elongate body 22 with a suction opening 24 at the end remote from the neck 30. In the manner of known crevice tools, the elongate body 22 is relatively long and slender to allow access to areas of floor which are otherwise difficult to access, and the suction opening 24 lies in a plane which is inclined to the longitudinal  
10 axis of the elongate body 22.

The neck 30 is manufactured integrally with the head 20 and is adapted to co-operate with the end of a wand or hose of a cleaning appliance (not shown). The head 30 has a first portion 32 which comprises a part-cylindrical wall 34 extending axially away from  
15 the head 20. The outer surface of the part-cylindrical wall 34 is dimensioned so as to be capable of being inserted into the end of the wand or hose and retained therein by means of a friction fit. In this embodiment, the part-cylindrical wall 34 extends circumferentially over approximately 250°. The head 30 also has a second portion 36 which comprises a part-cylindrical wall 38. The part-cylindrical wall 38 projects  
20 inwardly with respect to the first portion 32.

The first and second portions 32, 36 together delimit an air passageway 40 through the neck 30 of the crevice tool 10. This air passageway 40 communicates with the interior of the body 20 of the crevice tool 10 to define an air passageway which extends the  
25 entire length of the crevice tool 10.

Figure 2 illustrates the manner in which the crevice tool 10 is connected to the cylindrical end or mouth 50 of a hose or wand of a cleaning appliance. The neck 30 of the crevice tool 10 is inserted into the end 50 of the hose or wand so that the first  
30 portion 32 lies directly adjacent the inner wall 52 of the mouth 50. The dimensions of the first portion 32 ensure that the crevice tool 10 is held reliably in the mouth 50 by

friction. However, the second portion 36 is spaced away from the wall 52 of the mouth 50 as shown in Figure 2. A second air passageway 42, separate from the air passageway 40, is formed between the second portion 36 and the mouth 50.

5 In use, when the crevice tool 10 is attached to the mouth 50 of a hose or wand of a vacuum cleaner, both the air passageway 40 and the second air passageway 42 are in communication with the hose or wand which, in turn, is in communication with a suction fan (not shown). Air is thus drawn into the hose or wand via both air passageways 40, 42. The air passageway 40 draws air into the crevice tool 10 via the  
10 suction opening 24 which will be manoeuvred by the user of the vacuum cleaner across the surface to be cleaned. Simultaneously, air will be drawn into the second air passageway 42 from the atmosphere at a location spaced away from the surface to be cleaned. This has the effect of reducing the suction developed at the suction opening 24 so that the likelihood of the crevice tool 10 becoming stuck to the surface is reduced in  
15 comparison to that which would prevail had the second air passageway 42 not been provided.

It will be appreciated from the foregoing description that the invention resides primarily in the shape and construction of the neck 30 of the crevice tool 10. The invention is  
20 therefore applicable to other types of attachment for cleaning appliances and two alternative attachments are illustrated in Figures 3a, 3b, 4a and 4b. The attachment shown in Figures 3a and 3b is a stair tool 60 having a head 62 and a neck 64. The head 62 of the stair tool 60 has a suction opening 62a formed in a generally planar lower face 62b. The neck 64, like the neck 30 of the crevice tool 10 described above, has a first  
25 part-cylindrical portion 66 and a second part-cylindrical portion 68 which projects inwardly from the first portion 66. The first portion 66 and the second portion 68 together define an air passageway 70 which communicates with the interior of the head 62. The interior of the head 64 and the air passageway 70 together provide an air passageway which extends from the suction opening 62a through the entire length of the  
30 stair tool 60.

The attachment shown in Figures 4a and 4b is a brush tool 80. The brush tool 80 has a head 82 and a neck 84. The head 82 consists of a support ring 82a carrying an arrangement of bristles 82b arranged about an opening in the support ring, and a tapered portion 82c extending between the support ring 82a and the neck 84. The ends of the bristles 82b remote from the neck 84 define a suction opening 82d. The neck 84, as in the previous embodiments, has a first part-cylindrical portion 86 and a second part-cylindrical portion 88. The second portion 88 projects inwardly from the first portion 86 and, together with the first portion 86, delimits an air passageway 90 through the neck 84. The air passageway 90 communicates with the interior of the head 82 and the suction opening 82d to form an air passageway which extends the entire length of the brush tool 80.

Each of the stair tool 60 and the brush tool 80 can be attached to the mouth 50 of a hose or wand in exactly the same way as the crevice tool 10 can be attached thereto. In each case, the neck 64, 84 is inserted into the mouth 50 of the hose or wand of a vacuum cleaner or other cleaning appliance so that the first portion 66, 86 fits tightly against the inner wall 52 of the mouth 50. The second portion 68, 88 of the neck 64, 84 is spaced apart from the mouth 50 so that a second air passageway is formed alongside the air passageway 70, 90 but separate therefrom. When the vacuum cleaner or other appliance is in use with the stair tool 60 or brush tool 80 attached to the hose or wand thereof, air is drawn into the attachment 60, 80 via the suction opening 62a, 82d so as to allow cleaning to be carried out, but air is also drawn into the hose or wand via the second air passageway. This is spaced away from the suction opening 62a, 82d and has the effect of reducing the amount of suction developed at the suction opening 62a, 82d.

A further advantage of the arrangement of the neck of the attachments described above is that they can be stored more compactly than tools having a cylindrical neck. This point is illustrated in Figures 5a and 5b. Figures 5a and 5b show a wand 100 of a vacuum cleaner on which is carried an attachment holder 110 carrying a crevice tool 10, a stair tool 60 and a brush tool 80 as described above. The attachment holder 110 essentially comprises a part-cylindrical central wall 112 which is manufactured from a

sufficiently resilient material to allow the holder 110 to be snapped onto or off the wand 100. If desired, locating means (not shown) can be provided to reduce the risk of the holder 110 sliding along the wand 100 unintentionally. The central wall 112 of the holder 110 carries three tongues 114 which are integrally moulded therewith. These  
5 tongues 114 are shaped to lie inside the air passageway 40, 70, 90 alongside the second portion 36, 68, 98 of the neck of each respective tool 10, 60, 80. They are also resiliently biased towards the central wall 112 to provide a small amount of retaining force so as to hold the respective tool in place on the holder 110. The surface of each tongue 114 can be textured or coated with a material which will enhance the gripping  
10 capability of the tongues 114 if desired. Interengaging parts (not shown), such as notches and grooves, can also be provided on the second portions 36, 68, 98 of the attachments 10, 60, 80 and on either the tongues 114 or the central wall 112 of the holder 110 in order to assist with the retaining of the attachments 10, 60 80 on the holder 110.

15 The advantage of the arrangement of the invention is illustrated most clearly in Figure 5b. As can be seen from this drawing, the provision of the part-cylindrical second portions 36, 68, 98 as part of the necks 30, 64, 84 of the attachments 10, 60, 80 allows the attachments 10, 60, 80 to be held on the wand or hose in a position which is closer  
20 to the wand or hose than would be the case if the necks 30, 64, 84 had been cylindrical. This provides for a more compact storage solution than has previously been possible.

It will be appreciated that, in the cases of the crevice tool 10 and the stair tool 60 shown in Figures 1a, 1b, 3a and 3b, the normal design of the head 20, 60 does not project  
25 beyond the second portion 36, 68. However, in the case of the brush tool 80 shown in Figures 4a and 4b, the head 82 includes a part-cylindrical portion 82e which continues the line of the second portion 88 into the tapered portion 82c and the support ring 82a. The part-cylindrical portion 82e forms a continuous surface with the second portion 88. This ensures that, when the brush tool 80 is attached to the holder 110 shown in Figure  
30 5a, the shape of the head 82 of the brush tool 80 does not prevent the brush tool 80 from

being reliably and securely attached to the holder 110 and also that the brush tool 80 is held against the holder 110 in as compact a way as possible.

Figure 6 shows a vacuum cleaner 120 having a main body 122 containing separating  
5 apparatus 124 which, in the embodiment shown, takes the form of cyclonic separating apparatus. The vacuum cleaner 120 has a floor tool 126 which is connected to the main body 122 via a wand 128 and a hose 130. An attachment holder 110 of the sort shown in Figures 5a and 5b is releasably secured to the hose 130 as shown. The holder 110 can also be snap-fitted onto the wand 128 if desired. Attachments 10, 60 80 are held on  
10 the holder 110 whilst not in use but can be removed and secured to the distal end 128a of the wand 128 in place of the floor tool 126 when required. Alternatively, the attachments can be secured to the distal end 130a of the hose 130.

The configuration of the neck of each of the tools described above, in which the second  
15 portion is part-cylindrical in shape and extends inwardly from the first portion, offers an attractive storage benefit. However, alternative configurations are equally possible and three alternative embodiments are illustrated in Figures 7a, 7b and 7c. In the configuration shown in Figure 7a, the neck 150 has a part-cylindrical first portion 152, as in the previously described embodiments. However, the second portion 154 is  
20 angular instead of part-cylindrical. The second portion 154 projects inwardly from the first portion 152 so that, when the neck 150 is inserted into the mouth 156 of a hose or wand of a vacuum cleaner, a second air passageway 158 is formed between the mouth 156 and the second portion 154.

25 In Figure 7b, the neck 160 has a part-cylindrical first portion 162 and a planar second portion 164 which forms a chord between the ends of the first portion 162. When the neck 160 is inserted into the mouth 166 of the hose or wand, a second air passageway 168 is formed between the mouth 156 and the second portion 164.

30 In a further alternative arrangement, the neck 170 has a part-cylindrical first portion 172 and a part-cylindrical second portion 174. However, the second portion extends



outwardly from the first portion 172. In this arrangement, the attachment of which the neck 170 forms part must be attached to the mouth 176 of a hose or wand by being fitted around the outer surface of the mouth 176, again by means of a friction fit. A second air passageway 178 is then formed between the mouth 176 and the second portion 174. Air is bled into the hose or wand along the second air passageway 178 at the same time that air is drawn into the hose or wand via the suction opening forming part of the attachment, thus reducing the suction which would otherwise be developed at the suction opening.

The attachments and attachment holder described above can conveniently be manufactured by moulding from a plastics material.

Various modifications to the embodiments described above will be apparent to a skilled reader. For example, the precise shape of the second portion of the neck can be varied beyond the shapes shown in the drawings. Also, the invention is not limited to crevice tools, brush tools and stair tools and other types of attachment can have a neck of the type described. The tools can also be stored on the main body of the cleaning appliance or elsewhere and storage on an attachment holder of the type described is not essential. The attachments can be provided for cleaning appliances other than vacuum cleaners, for example, carpet shampooers, steam cleaners, etc.